

Remarks:

Reconsideration of the application is requested.

Claims 1-5, 7-27, 31, 33 and 35-37 are now in the application. Claims 7, 15, 17, 19, and 24 have been amended. Claims 35-37 have been added and claims 29, 32, and 34 have been cancelled.

In item 5 on page 2 of the above-identified Office action, claim 16 has been rejected as being indefinite under 35 U.S.C. § 112, second paragraph.

More specifically, the Examiner has stated that there is no antecedent basis for "said mounting tube".

Claim 16 depends from claim 15 and claim 15 has been rewritten to depend from claim 7. Support for the changes to claim 15 can be found by referring to claim 15 as originally filed. Antecedent basis for "said mounting tube" can be found in claim 7, as amended.

It is accordingly believed that the claims meet the requirements of 35 U.S.C. § 112, second paragraph. Should the Examiner find any further objectionable items, counsel would appreciate a telephone call during which the matter may be resolved. The above noted changes to the claims are provided solely for the purpose of satisfying the requirements of 35

U.S.C. § 112. The changes are neither provided for overcoming the prior art nor do they narrow the scope of the claims for any reason related to the statutory requirements for a patent.

Claim 7 has been rewritten in independent form including all of the limitations of claim 1. The Examiner has indicated that claim 7 is allowable. Claims 8-14 depend from claim 7 and are therefore allowable. Claims 15, 17, 19 and 24 have been amended to depend from claim 7 and therefore claims 15-19 and 24 are allowable.

Support for added claims 35 and 36 can be found by referring to claims 28 and 29 as originally presented. Support for added claim 37 can be found by referring to claims 31 and 7. Since claim 37 includes the mounting tube feature, it is believed to be patentable.

In item 8 on page 3 of the Office action, claims 1-5, 17-19, 24, 26-27, and 31 have been rejected as being obvious over Kaiser (4,701,012) in view of Pan (5,867,617) under 35 U.S.C. § 103. Applicant respectfully traverses with regard to claims 1, 31 and the claims that depend from claim 1.

Claims 1 and 31 each define an optical module including, inter alia, a first glass ferrule receiving a first optical

waveguide section, and a second glass ferrule receiving a second optical waveguide section.

The Examiner has stated that Kaiser does not disclose a first and second glass ferrules for receiving the first and second optical waveguide sections. The Examiner then states that Pan teaches a glass ferrule and that it would have been obvious to combine Pan and Kaiser to obtain the invention defined by claims 1 and 31.

Applicants first note that Kaiser discloses a multiplexer/demultiplexer in the form of a parallelepiped, see column 2, line 10. The lightwaves are not in a fiber. However, for a glass ferrule to receive the waveguide sections they need to be in the form of a fiber. Accordingly, the plate-like waveguide sections disclosed in Kaiser cannot be surrounded by a glass ferrule. There is no suggestion for the asserted combination and it is improper hindsight to assume that one of ordinary skill in the art would have used glass ferrules with the plate-like structure disclosed in Kaiser.

Second, although Pan discloses a glass ferrule 20, Pan does not disclose coupling light through the glass ferrule. Accordingly, from Pan, one of ordinary skill in the art could not learn to use a glass ferrule where light is coupled into

or out of a waveguide section at an angle relative to the optical axis of the waveguide.

Third, Pan does not disclose a glass ferrule having an end surface that is inclined. This feature is not disclosed or suggested in Kaiser or Pan. Claims 1 and 31 each define an optical module including, inter alia, a first glass ferrule having an end surface that is inclined, and a second glass ferrule having an end surface that is inclined.

In item 9 on page 5 of the Office action, claims 15, 29, 32, and 34 have been rejected as being obvious over Kaiser (4,701,012) under 35 U.S.C. § 103.

Claim 15 depends on claim 7 and should be patentable. Claims 29, 32 and 34 have been cancelled.

In item 10 on page 6 of the Office action, claims 25 and 33 have been allowed.

In item 11 on page 6 of the Office action, claims 7-14 and 20-23 have been objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim.

The indication of allowablity is greatly appreciated. Claim 7 has been rewritten in independent form, and claims 8-14 all depend from claim 7.

Applicants are confused about claim 20, however, since this is an independent claim.

In item 12 on page 6 of the Office action, the Examiner indicated that claim 16 would be allowable if rewritten to overcome the 112 rejections. Because of the change in dependency of claim 15, the 112 rejections of claim 16 have been overcome.

It is accordingly believed to be clear that none of the references, whether taken alone or in any combination, either show or suggest the features of claims 1, 7, 31, 33, and 37. Claims 1, 7, 31, 33, and 37 are, therefore, believed to be patentable over the art and since all of the dependent claims are ultimately dependent on one of these claims, they are believed to be patentable as well.

In view of the foregoing, reconsideration and allowance of claims 1-5, 7-24, 26-27, 31, and 35-37 are solicited.

In the event the Examiner should still find any of the claims to be unpatentable, he is respectfully requested to telephone

counsel so that, if possible, patentable language can be worked out.

Petition for extension is herewith made. The extension fee for response within a period of one month pursuant to Section 1.136(a) in the amount of \$110.00 in accordance with Section 1.17 is enclosed herewith.

Please charge any other fees which might be due with respect to Sections 1.16 and 1.17 to the Deposit Account of Lerner and Greenberg, P.A., No. 12-1099.

Respectfully submitted,

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For Applicants

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IT-273

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

Applicant : Lutz Melchior et al.
Applic. No. : 09/894,675
Filed : June 28, 2001
Title : Electro-Optical Module for Transmitting
and/or Receiving Optical Signals on at Least
Two Optical Data Channels
Examiner : Kevin S. Wood
Group Art Unit : 2874

VERSION WITH MARKINGS TO SHOW CHANGES MADE

In the claims:

Claim 7 (twice-amended). [The module according to claim 1,
comprising:] An electro-optical module for transmitting and/or
receiving light of a plurality of optical data channels,
comprising:

an optical waveguide for carrying light of a plurality of
optical data channels, said optical waveguide having an
optical axis, said optical waveguide forming at least two
optical waveguide sections, said at least two optical
waveguide sections including a first optical waveguide section
having an inclined end surface and a second optical waveguide
section having an inclined end surface;

at least one optical component, said optical component
selected from the group consisting of a transmitting component
providing light that is injected into said optical waveguide,
and a detecting component that receives and detects light
output from said optical waveguide;

a first glass ferrule;

a second glass ferrule; and

a mounting tube receiving said first glass ferrule, said first
optical waveguide section, said second glass ferrule, and said
second optical waveguide section;

said mounting tube axially positioning said first glass
ferrule with respect to said second glass ferrule;

said inclined end surface of said first optical waveguide
section being positioned along the optical axis and adjacent
said inclined end surface of said second optical waveguide
section;

said inclined end surface of said second optical waveguide
section configured to perform a function selected from the
group consisting of:

injecting light for one of said plurality of said optical data channels into said optical waveguide when the injected light is provided to said inclined end surface of said second optical waveguide section at an angle relative to the optical axis of said waveguide, and

outputting light of one of said plurality of said optical data channels from said optical waveguide at an angle relative to the optical axis of said waveguide;

said first glass ferrule receiving said first optical waveguide section and having an end surface that is inclined to correspond to said inclined end surface of said first optical waveguide section, said first glass ferrule being transparent for the light of the plurality of the optical channels; and

said second glass ferrule receiving said second optical waveguide section and having an end surface that is inclined to correspond to said inclined end surface of said second optical waveguide section, said second glass ferrule being transparent for the light of the plurality of the optical channels.

Claim 15 (twice-amended). [An electro-optical module for transmitting and/or receiving light of a plurality of optical data channels, comprising:

an optical waveguide for carrying light of a plurality of optical data channels, said optical waveguide having an optical axis;

at least one optical component, said optical component selected from the group consisting of a transmitting component providing light that is injected into said optical waveguide, and a detecting component that receives and detects light output from said optical waveguide; and

immersion means;

said optical waveguide forming at least two optical waveguide sections;

said at least two optical waveguide sections including a first optical waveguide section having an inclined end surface and a second optical waveguide section having an inclined end surface;

said inclined end surface of said first optical waveguide section being positioned along the optical axis and adjacent

said inclined end surface of said second optical waveguide section;

said inclined end surface of said second optical waveguide section configured to perform a function selected from the group consisting of:

injecting light for one of said plurality of said optical data channels into said optical waveguide when the injected light is provided to said inclined end surface of said second optical waveguide section at an angle relative to the optical axis of said waveguide, and

outputting light of one of said plurality of said optical data channels from said optical waveguide at an angle relative to the optical axis of said waveguide;

said first optical waveguide section and said second optical waveguide section defining a gap therebetween;

said immersion means filling said gap and having a matched refractive index.]

The module according to claim 7, comprising:

immersion means;

said first optical waveguide section and said second optical waveguide section defining a gap therebetween;

said immersion means filling said gap and having a matched refractive index.

Claim 17 (twice-amended). The module according to [claim 1] claim 7, comprising:

a plurality of waveguide sections having inclined surfaces, said plurality of said waveguide sections including said at least two waveguide sections;

said at least one optical component including a plurality of optical components that are each selected from the group consisting of a transmitting component providing light that is injected into said optical waveguide, and a detecting component that receives and detects light output from said optical waveguide;

said plurality of said optical components being sequentially located;

each one of said plurality of said optical components being associated with an inclined surface selected from the group

consisting of said inclined surfaces of said plurality of said waveguide sections.

Claim 19 (twice-amended). The module according to [claim 1] claim 7, wherein said second optical waveguide section has an optical axis and said optical component has an optical axis that runs essentially perpendicular to the optical axis of said second optical waveguide section.

Claim 24 (amended). The module according to [claim 1] claim 7, comprising:

a coupling lens;

said optical component and said inclined end surface of said second optical waveguide section defining a beam path therebetween;

said coupling lens located in the beam path between said optical component and said inclined end surface of said second optical waveguide section.